

### Abstract

5 Data structures, systems, and methods are aspects of pattern recognition  
using observable operator models (OOMs). OOMs are more efficient than  
Hidden Markov Models (HMMs). A data structure for an OOM has  
characteristic events, an initial distribution vector, a probability transition matrix,  
an occurrence count matrix, and at least one observable operator. System  
10 applications include computer systems, cellular phones, wearable computers,  
home control systems, fire safety or security systems, PDAs, and flight systems.  
A method of pattern recognition comprises training OOMs, receiving unknown  
input, computing matching probabilities, selecting the maximum probability, and  
displaying the match. A method of speech recognition comprises sampling a  
15 first input stream, performing a spectral analysis, clustering, training OOMs, and  
recognizing speech using the OOMs.

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